(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization

International Bureau





(43) International Publication Date 29 December 2004 (29.12.2004)

PCT

(10) International Publication Number WO 2004/114446 A1

(51) International Patent Classification7:

H01M 8/02

(21) International Application Number:

PCT/GB2004/002642

(22) International Filing Date: 17 June 2004 (17.06.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

PCT/GB03/02621 18 June 2003 (18.06.2003) GB 0316946.3 18 July 2003 (18.07.2003) GB 0407638.6 2 April 2004 (02.04.2004) GB

(63) Related by continuation (CON) or continuation-in-part (CIP) to earlier application:

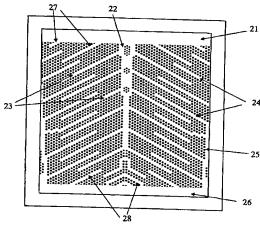
US PCT/GB03/02621 (CIP) Filed on 18 June 2003 (18.06.2003)

(71) Applicant (for all designated States except US): THE MORGAN CRUCIBLE COMPANY PLC [GB/GB]; Morgan House, Madeira Walk, Windsor Berkshire SL4 1EP (GB).

- (72) Inventors; and
- (75) Inventors/Applicants (for US only): CHAPMAN, Alan Robert [GB/GB]; Morgan Fuel Cell, Bewdley Road, Stourport-on-Severn Worcestershire DY13 8QR (GB). JAMAIS, Sylvain [FR/GB]; Morgan Fuel Cell, Bewdley Road, Stourport-on-Severn Worcestershire DY13 8QR (GB). MELLOR, Ian Michael [GB/GB]; Morgan Fuel Cell, Bewdley Road, Stourport-on-Severn Worcestershire DY13 8QR (GB). TURPIN, Mark Christopher [GB/GB]; Morgan Fuel Cell, Bewdley Road, Stourport-on-Severn Worcestershire DY13 8QR (GB). JOUVRAY, Alexandre [FR/GB]; Morgan Fuel Cell, Bewdley Road, Stourport-on-Severn Worcestershire DY13 8QR (GB).
- (74) Agent: PHILLIPS & LEIGH; 5 Pemberton Row, London, Greater London EC4A 3BA (GB).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,

[Continued on next page]

(54) Title: FLOW FIELD PLATE GEOMETRIES



(57) Abstract: The present invention provides a flow field plate (separator) for a fuel cell or electrolyser, comprising one or more branched primary fluid delivery/removal channels feeding narrower secondary fluid diffusion channels defined by an array of lands forming a network of interconnected fluid diffusion channels therebetween. The fluid delivery/removal channels and the fluid diffusion channels may be gas delivery/removal channels and gas diffusion channels respectively. The branched fluid delivery channels may simply feed the fluid diffusion channels, which themselves lead directly or via a fluid removal channel to a fluid outlet. The present invention additionally provides a flow field plate (separator) for a fuel cell or electrolyser, comprising a tiled array of flow field segments defining a reactant flow field, each segment comprising one or more branched primary fluid delivery/removal channels feeding narrower secondary fluid diffusion channels defined by an array of lands forming a network of interconnected fluid diffusion channels therebetween. The flow field segments may be connected in parallel, in series, or in combinations thereof. Preferably, the segments are connected in series, or in a parallel arrangement of series connected segments.





- PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

as to the identity of the inventor (Rule 4.17(i)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR,

- GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)
- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, Cl, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)
- of inventorship (Rule 4.17(iv)) for US only

Published:

with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.